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PRIORITY DOCUMENT

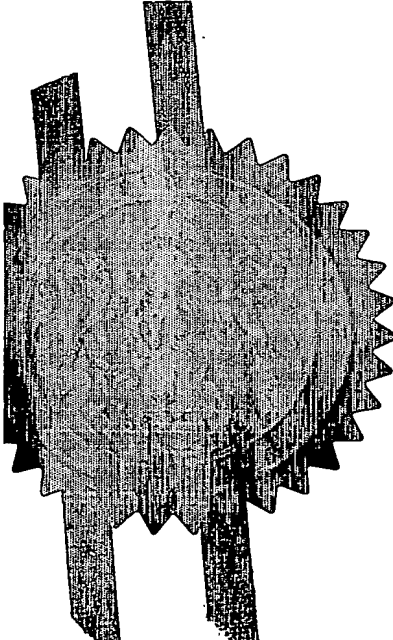
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Signed

H. Behan

Dated

17 July 2003



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Patent
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1/77

19AUG02 E741879-1 000393
P01/7700 0.00-0219210.2

The Patent Office

Cardiff Road
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Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference

2002P12985 GB / P72 / CF / GD

2. Patent application number
(The Patent Office will fill in this part)

0219210.2

17 AUG 2002

3. Full name, address and postcode of the or of each applicant (underline all surnames)

OXFORD MAGNET TECHNOLOGY LTD.
WHARF ROAD, EYNHAM
OXFORD OX8 1BP

Patents ADP number (if you know it)

647776002

UNITED KINGDOM

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

MODIFICATION IN COMPRESSOR CIRCUIT TO
PREVENT OIL CARRY OVER TO THE PULSE
TUBE REFRIGERATOR (PTR) COLD HEAD

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom
to which all correspondence should be sent
(including the postcode)

Siemens Shared Services Limited
Intellectual Property Department
The Lodge, Roke Manor
Romsey
Hampshire SO51 0ZN

Patents ADP number (if you know it)

08439358001

If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

Yes

- a) any application named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

9. Enter the number of sheets for any of the following items you are filling with this form.
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Continuation sheets of this form

Description	2
Claim(s)	0
Abstract	0
Drawing(s)	0

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translation of priority documents

Statement of inventorship and right to grant a patent (*Patents Form 7/77*)

1

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents
(please specify)

11.

We request the grant of a patent on the basis of this application

Signature

Date

Clive French

Clive French
Intellectual Property Department

16.08.2002

12. Name and daytime telephone number of Person to contact in the United Kingdom

Clive French

01794 833573

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Notes

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505
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Modification in Compressor Capsule to prevent Oil carry over to the Pulse Tube Refrigerator (PTR) Cold head

Authors : Milind Atrey, D. Crowley

Oil Carry over in the PTR

It is observed that oil migrates from the compressor to the PTR cold head through the Low pressure (LP) flex line. The reason for this is a high pressure difference developed due to stoppage of the PTR's rotary valve when the compressor is dynamic. When the rotary valve stops, the compressor pressure increases to very high value, 28-29 bar approximately, and the low pressure flex line experiences a sudden fall in the pressure down to 1.5- 2 bar approximately. As a result, a part of the (oil+ gas) mixture is bypassed internally without going to the adsorber and also travels across the non return valve (NRV) due to high pressure difference. If this action continues over a period of time, the LP flex line becomes flooded with oil and then the PTR cold head and the high pressure flex line also. The PTR in this condition can not function satisfactorily and one may have to discard the whole system due to severe contamination.

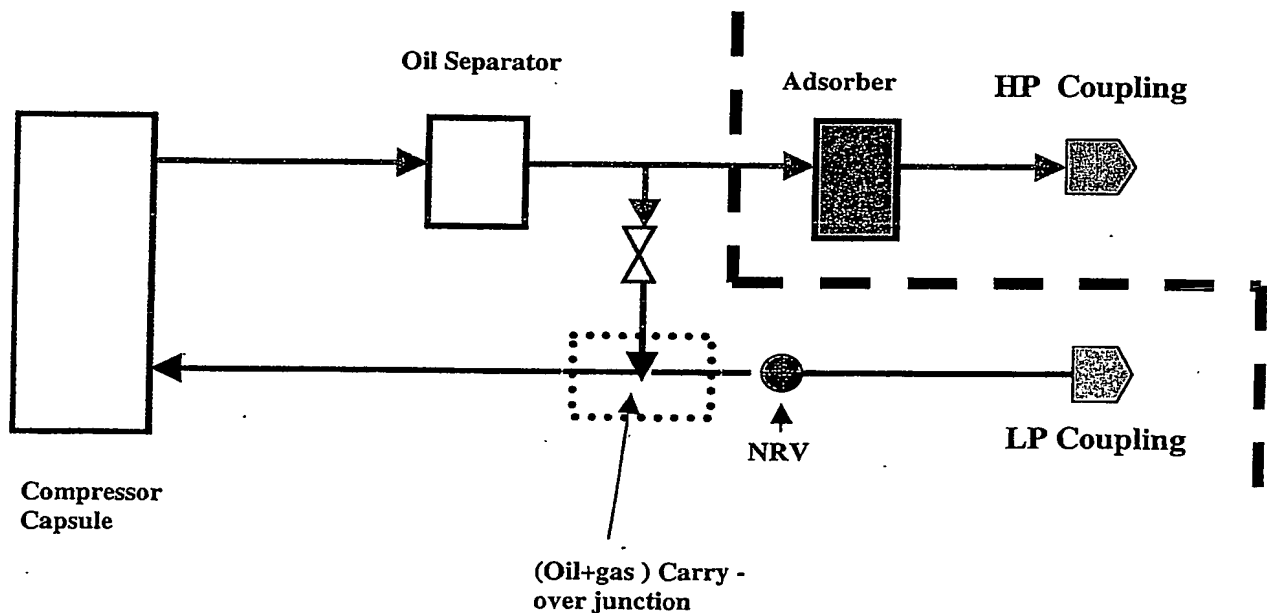


Fig. 1 Present System

Proposed Modification

The proposed modification suggests the removal of the junction shown in Fig. 1 where (oil + gas) mixture sees the LP flex line connected to the PTR cold head. Instead, if the two lines are separated and the compressor capsule has two parallel connections as shown below instead of one, the (oil + gas) mixture will not be able to stream into the PTR cold head.

The capsule has to be accordingly modified to ensure that the (oil+gas) mixture is fed to the innermost suction point of the scroll to overcome any possibility of getting (oil+gas) mixture in the normal return line of the system.

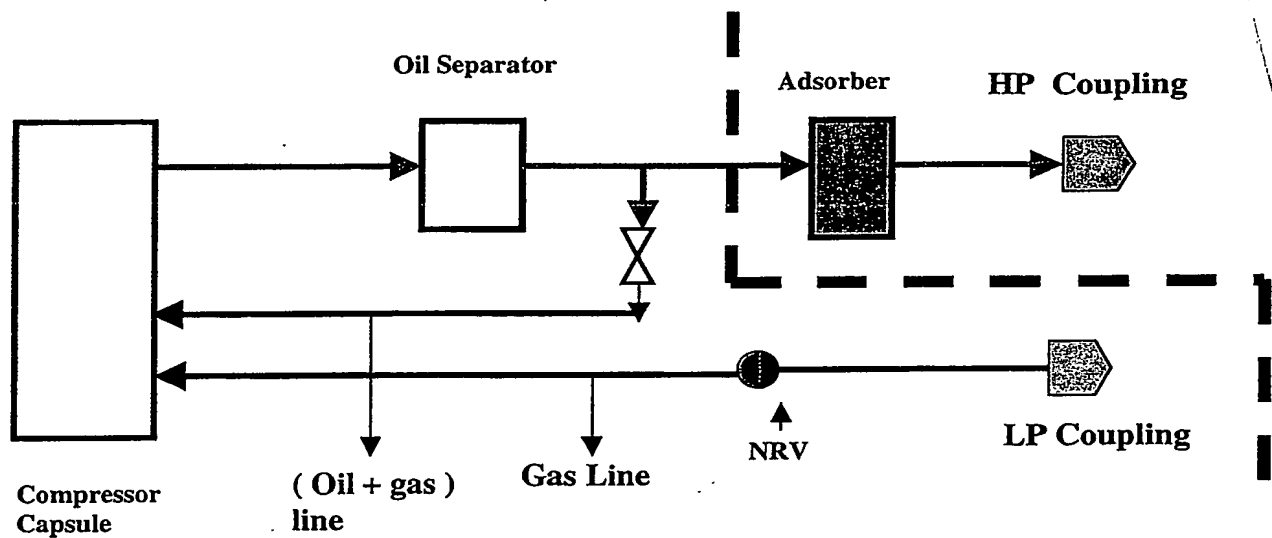


Fig. 2 Proposed Modification in the system

Advantages of this Modification

The use of these parallel return lines separates the normal return line (gas line) from the (gas + oil) line which becomes active only when the compressor goes into internal bypass condition due to high pressure. If the (oil+gas) line is fed to scroll at its greatest suction point, oil will be prevented from entering the return LP line connected to the PTR cold head.